

THE LARVA OF *LAGIUM ATROVIOLACEUM* (NORTON)
(HYMENOPTERA: TENTHREDINIDAE)

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Abstract.—The larva of *Lagium atroviolaceum* (Norton) is described and illustrated and separated from other genera of North American Tenthredininae. *Lagium* is a monotypic genus, and the larva possesses several unique features, including rows of tubercles present on each annulet of the body, that support the validity of the genus and maintain its close affinity with the East Asian genus *Lagidina*.

Key Words: Elderberry, *Lagidina*, *Lagium*, larva, *Sambucus*, sawfly

The subfamily Tenthredininae is the second largest subfamily of Tenthredinidae in North America. The larvae, however, have received little attention, and very few have been described, probably due to difficulty in rearing and because few feed on economically important plants. Larvae of most genera of the subfamily have not been adequately defined because specimens representative of many groups are lacking. The larva of *Lagium atroviolaceum* (Norton) has several unique characteristics not present in other known Tenthredininae, and it shares some of these characteristics with *Lagidina*, a genus that occurs in eastern Asia.

Lagium atroviolaceum is the only species in *Lagium* (Smith 1986). The only information on the larva is the description by Dyar (1897), who briefly described it under the name "*Tenthredo atroviolacea* Norton, var. *peratra*, var. nov." and stated that it was "feeding on the elder." A reared adult, the holotype of *peratra* labeled "7W," is in the National Museum of Natural History, Washington, D.C. (Smith 1987). Since that time, the larva has not been collected or treated in the literature. Yuasa (1922) did not mention the larva of this species. The

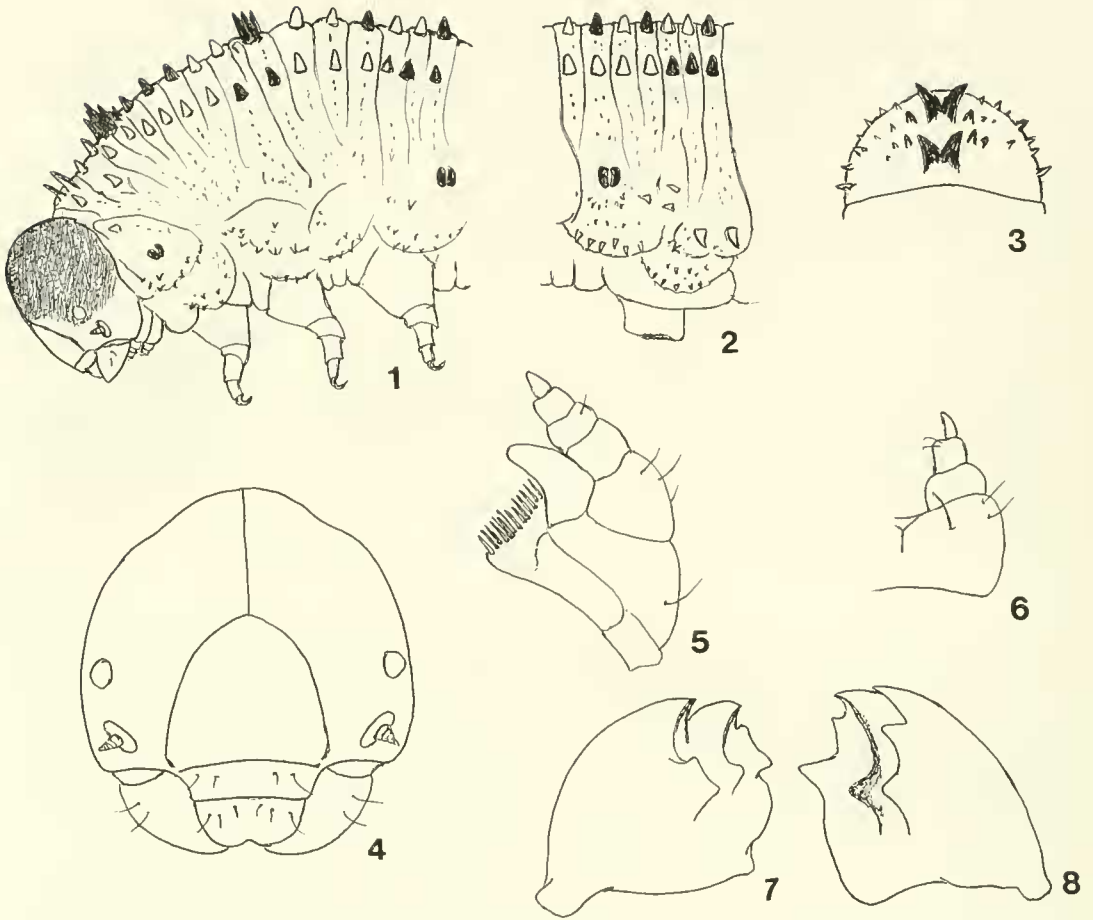
larva, however, is so unique that even Dyar's brief characterization is adequate to recognize it.

During the past several years, I collected some larvae feeding on *Sambucus canadensis* L. (Caprifoliaceae) that belong to the Tenthredininae but are unlike other tenthredinine larvae. They were collected in habitats where adults of *L. atroviolaceum* were numerous earlier in the spring and early summer, and they agree exactly with Dyar's description. These are described in more detail below and separated from related genera of Tenthredininae.

Lagium atroviolaceum (Norton)
(Figs. 1-8)

Dyar's (1897) description.—"The larva is a very curious one. For a Tenthredinid remarkably specialized, having reached the stage of some Noctuid Lepidoptera (e.g. *Pseudoglossa lubricalis* or *Cucullia artemisiae*).

Looks a little flattened, but thick and robust. Feet on joints 6 to 13. Head round, dull black; width 1.4 mm. Body segments 7-annulate, the whole body soft dark gray, the ground color uniform. A series of short



Figs. 1-8. *Larium atroviolaceum*, larva. 1, Head and thorax. 2, Third abdominal segment. 3, 10th abdominal segment, dorsal view. 4, Head, front view (hairs and coloration not shown). 5, Maxilla. 6, Labium. 7, Right mandible, ventral view. 8, Left mandible, ventral view.

thick papillae, one on each annulet in subdorsal and lateral even regular rows, and other smaller ones scattered subventrally. First row (subdorsal), which is the shorter, has the papilla on annulet 1 orange, 2-4 black, 5-6 orange, 7th black; second row (lateral) which is larger, has 1st to 4th orange, 5th to 7th black; two behind the spiracle and two subventrally posteriorly pale orange; two groups of six to eight very small ones on the upper and lower subventral folds whitish. Sides with a number of small black spots. On thorax there are less of the papillae, but the alternation in color is similar. Anal plate not differentiated.

Ultimate stage.—Smooth, very shiny, entirely dark slate blue black, papillae indicated by very small concolorous points. Thoracic feet pale. Enters the earth at once to form a moderately firm hibernating cell.

Sent me by Mrs. Slosson from Franconia, N.H., feeding on the elder.”

Larva (late feeding stage).—Length, 25-30 mm. Head black on dorsum and on sides to below level of eye, white on frons and below eye; mandible dark brown. Body rather uniformly grayish green when alive, mottled with small dark blackish spots; spiracle wings dark brown; dark brown spot on apex of each proleg. Following tubercles dark

brown; first subdorsal row with large multispined tubercles on anterior annulets of meso- and metathorax; 2nd to 4th conical tubercles of mesothorax, 4th and 7th of metathorax, and 2nd, 4th, and 7th of each abdominal segment; second subdorsal row with conical tubercle 6 of mesothorax, 1st, 6th and 7th of metathorax, and 5th–7th of each abdominal segment; and bifurcate spines on 10th tergum.

Head in front view slightly indented dorso-laterally (Fig. 4); texture dull, with granular appearance; abundant short hairs and about 25–30 on frons; hairs stout, length of most $.35\times$ or less eye length with 8–10 hairs on frons and 10 or more near base of mandible and posterior to antenna 2–3 \times longer than other hairs and about equal to eye length. Antenna conical, 5-segmented. Clypeus vaguely divided at center into post- and preclypeus with 2 setae on each side of postclypeus; labrum with 3 setae on each side; mandible with 2 setae on outer surface. Labrum symmetrical; epipharynx with 10–15 stout spines on each half. Maxillary palpus (Fig. 5) 4-segmented; second segment with 1 seta; palpifer with 3–4 setae; stipes with 1 seta; lacinia with 14–16 stout spines. Labial palpus (Fig. 6) 3-segmented; 2nd segment with 2 setae; submentum with 3 setae on each side. Left mandible (Fig. 8) with 4 large apical teeth, 2 teeth on ventral ridge, and mesal ridge with 1 large tooth at center; right mandible (Fig. 7) with 2 large apical teeth, ventral ridge with large truncate tooth, mesal ridge with 1 tooth, and dorsal ridge with large truncate tooth.

Body with two subdorsal rows of large, conical tubercles on each side, smaller tubercles on annulets and lobes on side of body; smaller tubercles each with minute papilla arising from apex; numerous minute tubercles covering integument. Thorax with tubercles arranged similar to Fig. 1. Prothorax with 3 apparent dorsal annulets; mesothorax with 6 dorsal annulets; metathorax with 7 dorsal annulets. Large, multispined tubercles on first subdorsal row on first an-

nulets of meso- and metathorax. Thoracic legs 5-segmented; tibiae with 15–20 setae, tibiae slightly shorter than femora. Abdominal segments 1–8 each with 7 dorsal annulets (3rd segment as in Fig. 2); first postspiracular area with 5 or 6 small tubercles; second postspiracular lobe with 2–3 large and 6–8 small tubercles; subspiracular lobe with 6–8 small tubercles; surpedal lobe with 8–12 small tubercles. Tenth tergum (Fig. 3) with two large bifurcate spines at center; apex and dorsum with many smaller tubercles. Prolegs on abdominal segments 2–8 and 10, without setae or tubercles; apices of prolegs dark brownish with minute darker brown tubercles giving area a roughened appearance.

Specimens.—Described from larvae collected on *Sambucus canadensis*, at two sites in Virginia: Louisa Co., 4 mi. S Cuckoo, VIII-22-1989, IX-12-1989; Essex Co., 1 mi. SE Dunnsville, VIII-14-1992. In the National Museum of Natural History, Washington, D.C.

Relationships with North American Tenthredininae.—The larva will key to the Tenthredininae in Smith and Middlekauff (1987). The subfamily is characterized and separated from other subfamilies by the presence of prolegs on abdominal segments 2–8 and 10; 7 dorsal annulets on abdominal segments 1–8; left mandible with 3–4 lateral teeth and one mesal ridge; and tibiae with 13–18 setae.

Lagium is separated from other tenthredinine genera by the presence of the two subdorsal rows of large conical tubercles on each side of the body, with tubercles present on each annulet of each segment; large multispined spines on the thorax; large bifurcate spines of the tenth tergum; and two setae on the outer surface of each mandible. Because adequate samples of larvae are not available for other genera, a key to genera is not yet possible. I have not, however, seen other tenthredinine larvae with ornamentation similar to *L. atrovioleaceum*. Larvae of most other genera have tubercles and/or

setae only on certain annulets of each abdominal segment (commonly on annulets 2, 4, and 7 or on 2 and 4), and *Aglaostigma* larvae have one seta on the outer surface of the mandible. Lorenz and Kraus (1957) gave a key to tenthredinine genera of Europe, but *Lagium* is not similar to any of the genera they treated.

Relationships with *Lagidina*.—Species of *Lagidina*, all of which occur in eastern Asia, are similar to *Lagium*, and some of the species now placed in that genus were described in *Lagium*. Smith (1986) cited some of the similarities and differences in adults. The larvae of two species of *Lagidina* were described by Okutani (1963), *L. irritans* (Smith) which feeds on *Glechoma hederaceae* L., and *L. platycerus* (Marlatt) which feeds on *Viola* spp. *Lagium atroviolaceum* has similarities with Okutani's descriptions of *Lagidina* in that the setal patterns of most of the mouthparts are the same, there are many small "warts" on each annulet, the tenth tergum has two large spinelike warts centrally, and those species also possess large tubercles on each annulet on the dorsum of the body. In *Lagidina*, however, the head of one species has a pair of "lumps" on the frontal area, there is apparently only a single row of tubercles on each side of the body, the stipes and palpifer of the maxilla have more setae, and there are some other differences such as the size, shape, and position of the tubercles. Based on larvae and adults, *Lagium* and *Lagidina* are much more similar to each other than to other tenthredinine genera. I believe the larval characteristics of *Lagium* support its status as a genus and support its close relationship with *Lagidina*. The larvae of both genera are unique

in the Tenthredininae, and the two undoubtedly belong to the same lineage within the subfamily.

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